

### **ABSTRACT OF THE DISCLOSURE**

A method of designing a communication architecture comprising receiving a partitioned system, communication architecture topology, input traces and performance matrices. Analyzing and creating communication analysis graph (CAG). Partitioning communication instances to create partition clusters. Evaluating cluster statistics related to the partition clusters and assigning parameter values to the partition clusters to form a new system with new communication architecture. Reanalyzing the new system and recomputing performance metrics. If performance is improved then synthesizing CATs to realize optimized protocols. If performance is not improved then the process is repeated.